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Auto Attendance System

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Abstract: ***The goal of this study is to develop a computerized attendance system that tracks attendance and recognises users using facial recognition. The goal of the technique is to hold decision-makers, including administrators, more accountable for maintaining an educational institution's attendance. Our aim is to minimise human contacts while collecting attendance, not to completely remove them. When done manually, this procedure is laborious, time-consuming, and requires supplies like paper. The application of modern a step toward a prosperous and well-managed future in the industry whose activities rely on automation can be observed in technology that supports, develops, or reinstates the conventional technique of accounting attendance. Face recognition software has made access easier multimedia content. While enhancing human-computer interactions, the use of It's challenging for hackers to enter networks using facial recognition technology steal user credentials. These benefits are what facial recognition attendance systems offer, and they are what propels them up the global popularity ladder bring to the table which makes it climb the ladder higher in popularity in the world.***
Keywords: component, formatting, style, styling, insert.

I. INTRODUCTION

A person's face is a prominent aspect of their head and is distinctively personal to them. The use of computers to detect human faces by Woody Bledsoe, Helen Chan Wolf, and Charles Bisson in 1964–1965 marked the beginning of the field of face recognition. It was later determined that they concentrated on the facial landmarks, including the space between their lips and the centres of their eyes but most of their efforts went undetected. Following this study, other further investigations were conducted that helped make One of the most cutting-edge fields of technology currently in use is computerised facial recognition. Facebook recently implemented facial recognition technologies. and other social networking services to enhance user experience. Moreover, other mobile camera apps use facial recognition in features such as beautifying and age determination. Entertainment features in some other apps such as Instagram and snapchat are using Augmented Reality and Facial Recognition.

Now, Attendance plays a crucial role in determining a student’s eligibility to appear for exams and the overall involvement of the student in the course. Institutions therefore take attendance very seriously. However, it has also been noted that some students mark attendance for absent classmates via proxy attendances, which gives a small group of students an unfair advantage over the rest.Moreover, human error on the part of the teachers marking attendance is also possible. Facial recognition’s use for marking attendance eliminates the scope for these errors and inconsistencies. Companies, as well as educational institutions, frequently run into difficulties while logging a ledger for keeping track of staff presence. Automating the process with an AI system that recognises the pattern can solve this issue the worker or student as they enter the building, logs their attendance, and saves the attendance record in a database in case it's needed in the future derived from facial recognition technology in this application, we get the following advantages:

1) Reduced risk of manual mistakes
2) Time and human effort is saved as the persons responsible for marking the attendance do not have to manually mark it

A payroll system or a human resource management system can easily be facial recognition attendance system included. It also makes it possible to make the time-in, time-out, and date formats compatible with the other systems of an organisation because it is a modular and expandable system. Why Utilizing an AI attendance system offers considerably better automation than using a manual attendance system.. The AI daily updates the records and stores real-time data. This system not only records daily attendance but also generates very precise timesheets for a big number of employees. Facial Recognition Attendance Systems are the new age technology that delivers the institutions convenience. The attendance system keeps the use of cameras as the driving force. The up and coming initiatives in making the Facial Recognition Attendance Systems as the new state-of –the-art technology and the intention to make the lives of the users easier were the prime motivations behind our efforts in building this application.

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II. BACKGROUND

The primary aim of this study's main goal is to identify solutions offered by other authors and assess the limitations of their techniques. After considering all the possibilities, the most viable option shall be implemented.

[1] The author uses face recognition to carry out the idea of recording student attendance. They provide a strategy based on a local binary pattern and the principal component analysis approach. The system's efficiency and accuracy in identifying human faces, however, continue to raise questions. Researchers used quick PCA with back propagation in an effort to ease this problem in the future.

The authors [2] created a method that made use of Firebase and a Analysis of the provided attendance data using a histogram using the Oriented Gradient technique. The faces were correctly identified 99.38% of the time.

[3] The authors proposed an Eigenvalue and Eigenvector-based face recognition algorithm. issues emerged after the threshold value came out shorter than what was expected which caused problems.

In [4], a PC equipped with the incredibly helpful and functional language "MATLAB" and Microsoft Excel is utilised to carry out the suggested plan. Before shooting photos or videos, this aids connecting with camera into the PC and confirmingab to the camera driver has properly loaded and is suitable with the abor MATLAB. Faces to be cropped identity purposes. The chopped faces are compared to the database of all the faces using this method. After obtaining a After receiving a Once the system receives a satisfactory acknowledgement, it logs the attendance in an Excel file. The author of [5] employed a Deep Neural Networks-based technique and-based technique (DNNs),incorporating a special mix the system can automatically and instantly record attendance thanks to the YOLO V3 algorithms and Azure face API. This process ensures accuracy while saving time for ensures the correctness. According to the technique described in

[6] the facial recognition-based attendance management system gives students convenient access to correct attendance data. Ethernet wire is used to upload the data to the system. The system's simplicity of use, superior security, and user-friendliness are some of its best features. This technique aids in informing students about absences. The appropriate proctors and parents will also receive this information.

[7] implements the suggested automated attendance management system using the LBPH algorithm for face recognition and the haar cascades for face recognition. This system has the ability to track people entering the classroom, picture students and preserve their information in a database, train the images on both the camera and the database, and more. The system can recognise students from the webcam as they enter the classroom and pre-processes them for later processing.

[8] employed the Viola and Jones technique to generate they use technology and deal with bounding boxes in their studies. Principal Component Analysis, which provided the data's tags, was utilised to process additional data and track attendance in the database. Data compression, Local Binary Pattern Histograms, and the Viola-Jones Algorithm are all employed. To calculate the texturee, the authors of

[9] It was difficult to use this strategy. When adopting this approach, difficulty was experienced. With the help of fisher faces and random faces, the authors of

[10] categorised faces and used LDA to extract distinctive characteristics from them. This approach's unfavourable aspect was its vulnerability to a lot of using the guiding concepts and exposure of the Internet of Things [11]. The process makes use of microcontrollers and personal area networking technology. "Internet of Things"was used to build the module. Though, the pace of data transport is modest, therefore the range of application is constrained. In order to try and gather crucial data from an image, encode it, and compare it to another image saved in the database for facial In order to try to extract important information from an image, encode it, and compare it to another image recorded in the database for facial recognition systems, The authors of [12] used a method based on CNN and mathematical approaches to try to extract significant information from an image, encode it, and compare it to another image stored in the database for facial recognition systems. The The biggest disadvantage is that it requires a lot is a data According to the sizes of the classrooms, the authors of the authors of [13] created a method for figuring out how many cameras would be required to snap a shot of every student's face at a specific resolution. The disadvantage of this approach was that using many cameras could slow down the shutter speed of the camera.

In [14], the authors describe how they stored the recorded attendance using a raspberry pi and a cloud-based method. The data could not be retrieved using this s system in offline mode because it requires a live internet connection. Local binary patterns in the histogram and a modified version of the Jones algorithm were employee

In [15], faces were recognised using the modified Jones Algorithm and local binary patterns in the histogram. These strategies can be used to find and identify images of pupils.

They have student data saved in the dataset portraits. The images that were found and those in the dataset are contrasted. The children who are accurately identified are then added to our database automatically. Any person found in the classroom who is not on the list of student pictures included in the dataset is tagged as an intruder. A siren sounds as a warning when an intruder is seen.

In [16] , Three different algorithms were used to When you When the system was assessed, the KNN method was found to be the most accurate, scoring 99.27%. should assess the set-up while considering the lighting, students' head movements, facial expressions, and their proximity to the camera. KNN surpassed its rivals with a 97% total accuracy rate in tests conducted under various circumstances. Under the aforementioned criteria, CNN scored a 95% overall accuracy, while SVM scored an 88% accuracy. When it came to time complexity, CNN was found to have a low level. In comparison to the other two methods, SVM was shown to be the most time-consuming. In [17] , Before enhancing the AlexNet convolutional neural network, the author covers the overall architectural concept of the intelligent classroom attendance system. Before integrating RFID into the system, we also consider the necessity and effectiveness of the modification from a number of angles. The purpose we have finished the design and description of the back-end attendance management system. The study shows how a sophisticated facial recognition-based attendance system for classrooms might reduce attendance costs dramatically while also being effective and reliable.

The authors of this study constructed the method using LBPH (Local Binary Pattern Histogram) in a specific area of the surveillance camera [18]. They also have reliable outcomes for pose variance and lighting after obtaining satisfactory results from multiple experimental evaluations of this methodology. This method processes the full image in a lot less time.

In [19] , The system was implemented by the authors using the Dlib library. Using the YOLO model, faces were detected and added to the database. For real-time face detection in the later phase, the facial The API for Amazon Web Services' recognition. AWS performs better when comparing the LBPH classifier's recognition accuracy to the face recognition library. Library for Facial Recognition uses Dlib and accomplishes its goal with 99.38 percent accuracy while being similarly simple to use. The AWS identification API, which works in low-light situations, can identify people wearing masks. However, The other two methods, on the other hand, all depend on resolution augmentation techniques to work in low light, and they won't be able to tell between a person covering their face with a mask. The different Models for real-time testing were installed using the Flaskz framework

III. METHODOLOGY

Designing an automated attendance system is our plan operates by identifying individuals based on their faces and documenting their attendance..In order to make the recording of attendance more practical. The majority of the time, educational institutions and organizations employ this strategy. The automatic of the attendance process enables lesser use of human resources and time and also provides significantly higher accuracy as well as a thorough record of the attendance and the timesheets.

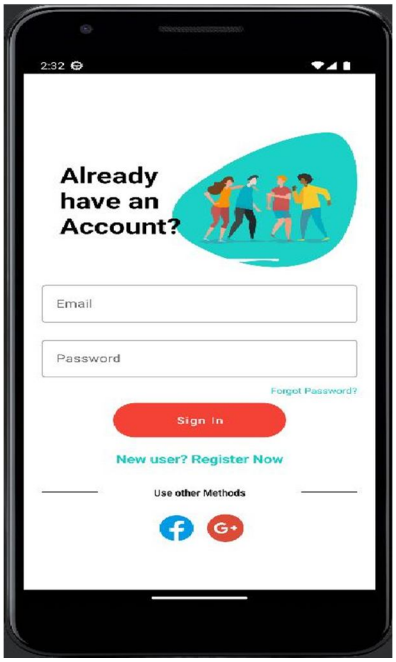
This system uses a high definition camera installed outside the classroom or any room picked by the management (in the case of an organization) that marks the atendance. People will enter the room after having their faces scanned by the camera. Additionally, a second camera is installed inside the room such that the lenses capture the view of the entire room and see every person in that room. Both cameras scan people's faces and record their attendance using facial recognition and identification technology. The person turns their face in the direction of the camera as they approach the door. Following that, the camera generates 128-d encodings that are compared to the 128-d encodings kept in the database while the system is being trained. When a match to the live data is found, the individual's name, entry time, and entry date are all entered to the database along with the person. If no match is found, this implies that the person’s face (using a photo) has not been trained into the system. The next person comes in such a case and the process is repeated. For new persons, the system needs to be trained by inputting their photo. The system continues working till it is manually turned off. The data is stored in a Firebase Console and By going to the designated web page and clicking a button that takes them to the firebase Console, the administrator or user can access them. However, the device only allows authorised users access after requesting their username and password.In case of the user forgetting the password, an alternate recovery email address is advised to be created so they can still access the option of changing the password by inputting their recovery email address. The same procedure is to be followed if the account is somehow stolen. Google Accounts are deemed to be extremely secure. Though the online access to the database is a preferable option, we have also kept track of the data offline in a real-time updating excel sheet that can be viewed even without an internet connection.

A. Implementation

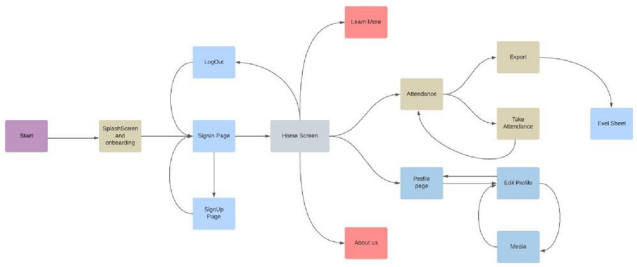
There are three basic stages to the implementation process:

1) Processing Before
2) Extraction of Features
3) Face Identification

IV. FIGURES



V. BLOCK DIAGRAM



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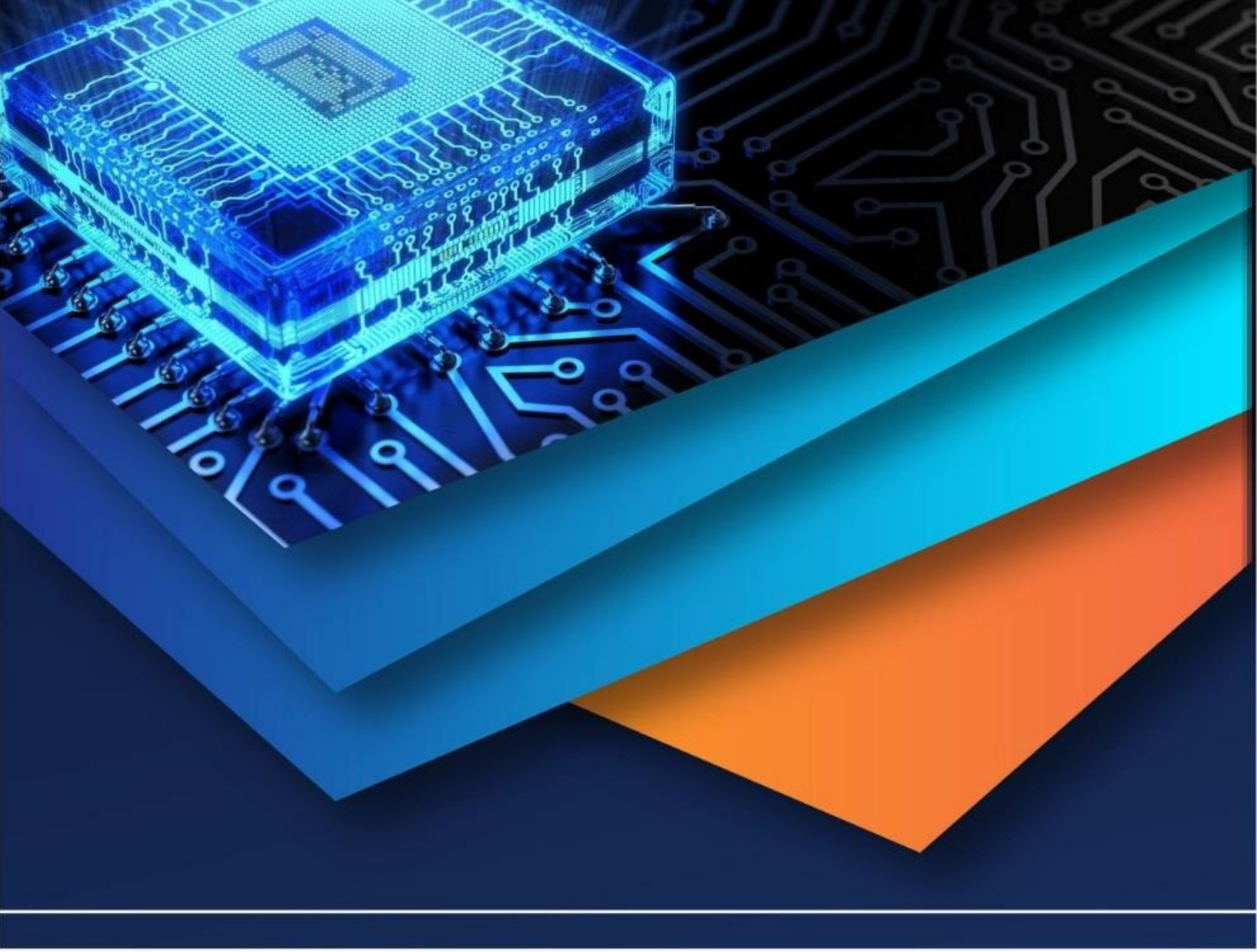

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